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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/801,683

03/17/2004

Yoshiyuki Tsuji

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22850

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09/17/2008

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ALEXANDRIA, VA 22314

EXAMINER

O HERN, BRENT T

ART UNIT

PAPER NUMBER

1794

NOTIFICATION DATE

DELIVERY MODE

09/17/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/801,683	Applicant(s) TSUJI ET AL.	
	Examiner Brent T. O'Hern	Art Unit 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 August 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,7-13,18,19,26-29 and 31 is/are pending in the application.
- 4a) Of the above claim(s) 8-11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,7,12,13,18,19,26-29 and 31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/12/2008</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 26 August 2008 has been entered.

IDS

2. Copies of the foreign references cited in the IDS filed 9/12/2008 have not been filed. Please submit.

Claims

3. Claims 1-2, 7-13, 18-19, 26-29 and 31 are pending with claims 8-11 withdrawn.

WITHDRAWN REJECTIONS

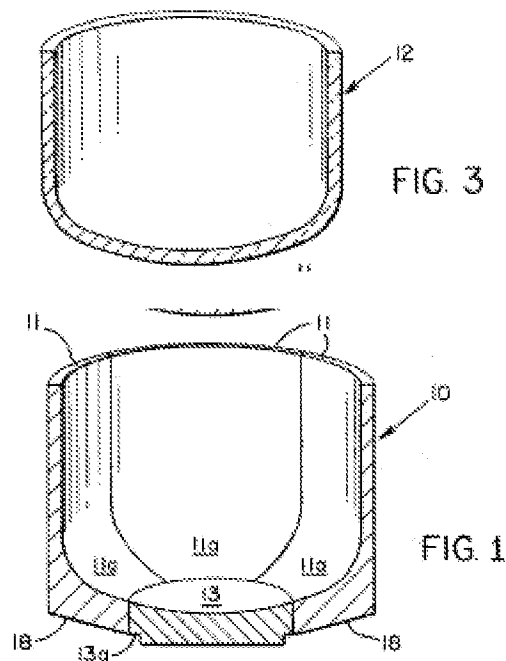
4. All rejections of record in the Office Action mailed 26 March 2008, pages 2-4, paragraphs 3-4 have been withdrawn due to Applicant's amendments in the Paper filed 26 August 2008.

NEW REJECTIONS

Claim Rejections - 35 USC § 103

5. Claims 1-2, 7, 12-13, 18-19, 26-29 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sarno (US 4,403,955) in view of Hill (US 2,947,114) with evidence by Tsuji et al. (US 6,524,668).

Sarno ('955) teaches a silica glass crucible for growing crystals having a wall part, an open diameter, an inner surface, an outer surface with a silica glass inner member and a graphite susceptor adhered to the outer surface of the silica glass crucible, with the outer surface of the inner member being rough in order to provide a nested two-member structure (See col. 3, ll. 26-35 and FIGs 1 and 3 crucible #12 having an rough outer surface that is placed into receptacle #10 made of graphite.),

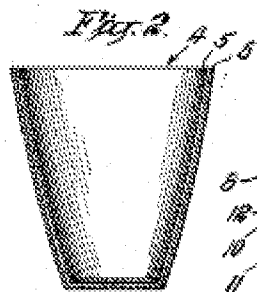


however, fails to expressly disclose wherein at least an outer surface of the wall part of the crucible is covered with fine grooves having a length of from $10\text{ }\mu\text{m}$ to $200\text{ }\mu\text{m}$ ($10\text{ }\mu\text{m}$ to $100\text{ }\mu\text{m}$), a width of from $10\text{ }\mu\text{m}$ to $30\text{ }\mu\text{m}$ and a depth of from more than $3\text{ }\mu\text{m}$ to less than $30\text{ }\mu\text{m}$ ($3\text{ }\mu\text{m}$ to $10\text{ }\mu\text{m}$); wherein a sliding frictional coefficient of the outer surface of the crucible to the graphite susceptor at 1500°C is more than 0.6, wherein the fine grooves exist on more than 10% and not more than 50% of the outer surface of the crucible, and wherein the outer surface of the crucible has projections having a height of

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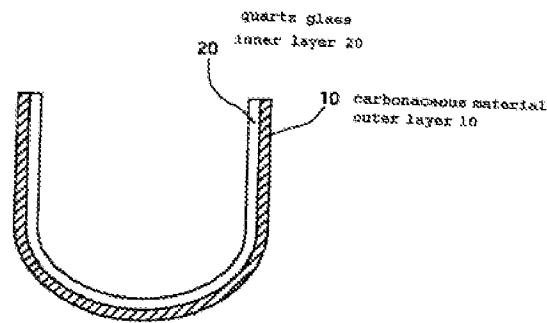
0.1 mm or more and the number of projections is an average of less than 5 /mm² per unit area on the outer surface of the crucible and wherein the grooves are only present on the outer surface of the crucible.

Hill ('114) teaches a crucible having a wall part, an open diameter, an inner surface, an outer surface with an inner member and outer member with either the outside surface of the inner member or the inside surface of the outer member are roughened by sand-blasting in order to provide a nested two-member structure (See *col. 3, ll. 10-16 and FIG-2, crucible #4 with inner liner #5 and outer base #6.*), for the purpose of improving the adhesion between the facing layers and providing a snug fit (See *col. 3, ll. 10-16 and col. 2, ll. 48-62.*).



Furthermore, see as evidence, where Tsuji ('668) teaches a silica glass crucible (See *col. 3, ll. 28-34 and FIG-1, #20.*) comprising a wall part, an open diameter an inner surface, and an outer surface (See *col. 3, ll. 28-34 and FIG-1, #20.*); and a graphite susceptor adhered to the outer surface of the silica glass crucible (See *col. 3, ll. 25-47 and FIG-1, #10.*) for the purpose of providing a crucible that is capable of pulling up monocrystalline silicone, having superior thermal resistance and mechanical strength (See *col. 1, ll. 8-16, col. 2, ll. 12-24 and Abstract.*).

FIG. 1



Regarding the dimensions and density of the grooves and frictional coefficient of the outer surface of the inner member, it would have been obvious to a person having ordinary skill in the art at the time Applicant's invention was made through routine optimization and experimentation to roughen the outer surface of the inner member to provide grooves with the above dimensions and density and frictional coefficient in order to improve the adhesion between the inner and outer members.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of Applicant's invention to provide Sarno's ('955) crucible with a roughened surface as taught by Hill ('114) and the above surface profile in order to provide a crucible having improved adhesion between the inner and outer members.

The phrase "used for pulling silicon single crystal" in claims 1 and 7, lines 1-2 of all claims are deemed to be a statement with regard to the **intended use** and is not further limiting in so far as the structure is concerned (see *MPEP 2111.02*). The above crucible is clearly capable of being used as such.

The phrase “wherein the outer surface of the crucible is covered with the fine grooves by carrying out a sand-blast treatment and a hydrofluoric acid etching on the outer surface” in claim 4, lines 2-4 are **process limitations** in a product claim and hence given little patentable weight since patentability of a product does not depend on its method of production (see MPEP § 2173.05(p)). The above surface is clearly capable of being prepared by the above process steps.

ANSWERS TO APPLICANT’S ARGUMENTS

6. In response to Applicant’s arguments (*pp. 7-12 of Applicant’s Paper filed 26 August 2008*) regarding Tsuji (‘668) as a primary reference, it is noted that Tsuji (‘668) is no longer cited as a primary reference and only cited as evidence as to the state of the art, thus, all arguments regarding such are moot.
7. In response to Applicant’s arguments (*p. 8, para. 5 to p. 9, para. 1 of Applicant’s Paper filed 26 August 2008*) that Hill (‘114) teaches against using silica for a crucible, it is noted that said reference is not cited for the material of the crucible but rather the well known roughening practice for adhering facing surfaces. Furthermore, the lack of silica relates to the specific formulation in the cited reference not to the use of silica as in Sarno (‘955).
8. In response to Applicant’s arguments (*p. 9, para. 2 to p. 10, para. 2 of Applicant’s Paper filed 26 August 2008*) that the presence of a coating in conjunction with a roughened surface in Hill (‘114) teaches away from using a roughened surface for crucibles, it is noted that roughening surfaces for improving adhesion is a well known

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practice for members and whether or not Hill ('114) also teaches a coating does not remove the teaching of roughening a surface to improve adhesion.

9. In response to Applicant's arguments (*p. 10, para. 3 to p. 12, para. 4 of Applicant's Paper filed 26 August 2008*) that the inherent roughness in Hill ('114) does not satisfy the claimed roughness and Hill ('114) teaches the outer member as being rough and the inner member as not being rough, it is noted that in the above arguments, the Examiner does not assert such. Furthermore, as stated above. As discussed above, the references teach roughening at least one facing surface for improving adhesion. Thus, any arguments regarding the contrary is against the position discussed above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brent T. O'Hern whose telephone number is (571)272-0496. The examiner can normally be reached on Monday-Thursday, 9:00-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald Tarazano can be reached on (571) 272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Brent T O'Hern/
Examiner, Art Unit 1794
September 4, 2008

/Elizabeth M. Cole/
Primary Examiner, Art Unit 1794